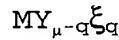


CLAIMS

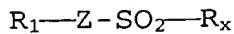
1. Use, as catalyst, of salts of elements of valency  $\mu$ , with  $\mu$  at least equal to 3, comprising, 5 as coanions, at least 1 and at most  $(\mu-1)$  anions carrying a sulfonyl functional group carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene  $(-\text{CF}_2-)$  group.

2. Use according to Claim 1, characterized 10 in that said salt corresponds to the formula:

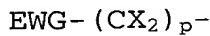


- where M represents a  $\mu$ -valent and at least trivalent element in the cationic form, preferably known to give Lewis acids;
- where Y is a monovalent anion or a monovalent anionic functional group and
- where  $\xi^-$  represents an anion or an anionic functional group carrying a sulfonyl functional group carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene  $(-\text{CF}_2-)$  group and
- where q is an integer advantageously chosen within the closed range (comprising the limits) ranging from 1 to  $(\mu-1)$  (that is to say, 1 or 2 when  $\mu$  is 20 25 3).

3. Use according to Claims 1 and 1, characterized in that said  $\xi^-$  corresponds to the formula:



- where Z represents an atom from the nitrogen column or a chalcogen;
- where, when Z represents an atom from the nitrogen column, R<sub>1</sub> represents an electron-withdrawing radical;
- where R<sub>x</sub> is a radical in which the atom, generally a carbon atom, carrying the sulfonyl functional group is perhalogenated, advantageously R<sub>x</sub> is R<sub>f</sub> of formula:



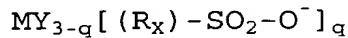
in which:

- the X groups, which are alike or different, represent a fluorine or a radical of formula C<sub>n</sub>F<sub>2n+1</sub>, with n an integer at most equal to 5, preferably to 2;
- p represents zero or an integer at most equal to 2, with the proviso that, when p represents zero, EWG is chlorine and especially fluorine;
- EWG represents a hydrocarbonaceous group, advantageously an electron-withdrawing group (that is to say, the Hammett constant σ<sub>p</sub> of which is greater than 0, advantageously than 0.1, preferably than 0.2), the possible functional groups of which are inert under the reaction conditions, preferably fluorine or a perfluorinated residue of formula C<sub>n</sub>F<sub>2n+1</sub>, with n an integer at most equal to 8, advantageously to 5.

4. Use according to Claims 1 to 3 of salts of elements of valency  $\mu$ , with  $\mu$  at least equal to 3, comprising, as coanions, at least 1 and at most  $(\mu-1)$  sulfonate anions in which the sulfonic functional group 5 is carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene (-CF<sub>2</sub>-) group.

5. Use according to Claim 4, characterized in that said use is the use as catalyst of Lewis acid 10 type.

6. Use according to Claims 1 to 5, characterized in that said salt corresponds to the formula:



15 with M represents an at least trivalent element in the cationic form, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional group and where R<sub>x</sub> is a radical in which the carbon carrying the sulfonic functional group is 20 perhalogenated and where q is an integer advantageously chosen between 1 and 2 (that is to say, 1 or 2).

7. Use according to Claims 1 to 6, characterized in that said salt is a salt of formula:



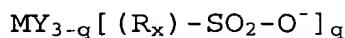
25 - where M is an element in an at least trivalent cationic form;  
 - where  $\mu$  represents the charge of the cation corresponding to M;

- where Y represents the anion or anions, other than the sulfonates perhalogenated on the carbon carrying said sulfonate functional group;
- where q represents an integer chosen within the closed range from 1 to  $\mu-1$ .

5 8. Use according to Claims 1 to 7, characterized in that said element is chosen from rare earth metals (scandium, yttrium, lanthanum and lanthanide) and elements forming a square in the 10 Periodic Table composed of gallium, germanium, arsenic, indium, tin, antimony, thallium, lead and bismuth.

9. Use according to Claims 1 to 8, characterized in that said salt is a trivalent metal salt comprising, as coanions, at least 1 and at most 2 15 sulfonate anions in which the sulfonic functional group is carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene ( $-CF_2-$ ) group.

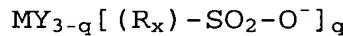
10. Use according to Claims 1 to 9, 20 characterized in that said salt corresponds to the formula:



with M representing a trivalent metal, preferably known for giving Lewis acids, where Y is a monovalent anion 25 or a monovalent anionic functional group and where  $R_x$  is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is an

integer advantageously chosen between 1 and 2 (that is to say, 1 or 2).

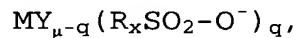
11. Catalytic composition, characterized in that it comprises one or more compounds corresponding 5 to the empirical formula:



with M representing an at least trivalent element, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional 10 group and where  $R_x$  is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is between 0.1 and 2.9, advantageously from 0.5 to 2.5, preferably from 1 to 2, inclusive.

15 12. Catalytic composition according to Claim 11, characterized in that it is obtained, advantageously in situ, by introduction of at least one acid  $\xi H$  onto a salt  $MY_\mu$  where M is advantageously chosen from [lacuna] earth metals, gallium, germanium, 20 arsenic, indium, tin, antimony, thallium and lead.

13. Compound of formula:

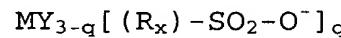


- where M is an element in an at least trivalent cationic form;
- 25 - where  $\mu$  represents the charge of the cation corresponding to M;

- where Y represents the anion or anions, other than the sulfonates perhalogenated on the carbon carrying said sulfonate functional group;
- where q represents an integer chosen within the closed range from 1 to  $\mu-1$ .

5

14. Compound according to Claim 13 of formula:



with M representing a trivalent metal, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional group and where  $R_x$  is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is an integer chosen between 1 and 2 (that is to say, 1 or 15 2).

15. Reactant comprising:

- a catalytic composition according to Claim 11;
- an agent capable of giving carbocations in the presence of Lewis acid chosen from acid anhydrides, in particular carboxylic and sulfonic anhydrides, carbonyls, in particular aldehydes, or conjugated dienes.

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16. Reactant comprising:

- a catalytic composition according to Claim 11;
- an oxygen-comprising heterocycle, chosen in 25 particular from cyclic ethers and lactones.